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Appendix IV.

[Vide answer to question No. 527 asked by Mr. R. Nagan Gowda at the meeting of the Legislative Council held on the 18th October 1927, page 34 supra.]

Note on a site for the proposed dam for the Tungabhadra Project, Bellary District, Madras.

15° 2′ : 75° 53′

The site for the proposed dam is near Timmalapuram, an abandoned village and fort on the right bank of the Tungabhadra about six miles south-west of Huvina Hadagalli, the headquarters of the taluk of the same name.

The country has been surveyed by the late Mr. Bruce-Foote (Mem. Geological Survey of India, Volume XXV) and more recently (1904-05) by Dr. J. M. Maclaren to whose party I was attached. A paper dealing with this area has been published by Dr. Maclaren in Records, Geological Survey of India, Volume XXXIV, part 2, where the following section is given across the Tungabhadra at this point (ib. page 104.):—

East to west.

16. Fissile chloritic schists weathering to micaceous schists (Shingtalur).
15. Banded hæmatitic quartzites (at the temples).
14. Massive chloritic schist.
13. Thin boulder bed with much flattened pebbles.
12. Banded hæmatitic quartzite.
11. Massive chloritic schist.
10. Felsite.
9. Diabase and hornblende schist.
8. Massive gritty felspathic schist.
7. Fissile chloritic schist with banded hæmatite quartzite (Hamigi).
6. Boulder bed with diabase dyke.
5. Fissile chloritic schist.
4. Boulder bed.
3. Micaceous schist with banded hæmatite schist.
2. Diabase dyke.
1. Massive hornblende schist.

These beds extend across the river though most of them are marked by the soil. All the rocks belong to the Dharwar series and have archæan granites and gneisses on either side.

Though Dr. Maclaren has not shown some of these beds as being continuous on the southern side of the river (see Records XXXIV, Part 14), they are to be found close to the abandoned village-site of Bajrala. There is a band of felsite and some of the altered diabase bands. The only map available of this area is the old revenue survey map which does not give a correct idea of the topography.

In the nalas south of the river between Timmalapuram and Honnum a few beds of impure limestone are found.

Gadag Tahsil, Bombay Presidency.

The only possible site for a dam appears to be between the northern termination of the hill (about $1\frac{1}{2}$ miles south of Timmalapuram) and the southern end of the chain of hills extending north of the Tungabhadra near Shingtalur. The site is marked on the accompanying tracing by two red

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lines The proposed site runs in a north-east to south-west direction approximately at right angles to the foliation planes of the rocks exposed on the river which have a north-easterly dip varying from 40 feet to 60 feet.

The bed of the Tungabhadra has a gentle fall for miles--averaging about two feet in a mile. The banks slope gently towards the river. There are no precipices and there are no prominent hills for 40 miles except the ones mentioned in the previous paragraph.

Thus a dam anywhere else except between the hills mentioned will have to be a very long one. Here the length of the dam will be a little less than two miles. The rocks are fairly hard and some of them will be impervious to water. Though the diabase and hornblende schists are jointed they will be found to be compact at depth. The felsite is quite a hard rock and so in the hæmatite quartzite. The microscopic characters of the rocks are as follows (Records, Geological Survey of India, Volume XXXIV, part 2, page 108) :--

Massive gritty schist--shows as an aggregate of oriented quartz and felspar grains with a little chlorite disposed in bands through the rock. An original grey rock or felspathic grit. Chloritic schists: Well banded generally showing rounded or elongated crystals of quarts and felspar in an irresolvable matric with ferruginous material and ferro-magnesian silicate occasionally wrapping round the 'eyes' of quartz or felspar.

Hæmatite--magnetite quartzites—The component minerals are quartz hæmatite and magnitite—any one of the two first prevailing at times to the exclusion of the other two.

Short notes will be found about the other rocks in the paper mentioned.

Though there is a repetition of some of the beds in this section it is not quite clear whether there is folding. Even if there is, it is not likely that it would interfere with the foundation.

The boulder bed is quite hard and stands out in the bed of the river near Timmalapuram. The only soft beds are the chlorite schists, but as most of them weather into clay there is not likely to be much percolation through them.

The north bank of the river is in the Bombay Presidency which appears to be on a higher elevation than the country to the south. It is hilly unlike the country to the south. The level of the river is about 1,640 feet near Timmalapuram. To the south there is a gradual elevation to about 1,800 feet. The country is undulating and open except for the hill south of Timmalapuram.

There is a low saddle north of the hill on the left bank of the Tungabhadra which would, I think, be suitable for disposing of the surplus water of the proposed reservoir.

I have suggested to the local Public Works Department officer that trenches should be dug along the line of the proposed site. When this is done, the actual width of the beds exposed can be ascertained and a fuller report will be submitted.

CASTLE ROCK,
31st March 1927.

M. VINAYAK RAO,
Assistant Superintendent, Geological Survey of India.